

(FILE 'HOME' ENTERED AT 15:16:03 ON 30 AUG 2005)

FILE 'CA' ENTERED AT 15:16:12 ON 30 AUG 2005  
S PC/PCT

L1 FILE 'REGISTRY' ENTERED AT 15:16:23 ON 30 AUG 2005  
17997 S PC/PCT

L2 FILE 'CA' ENTERED AT 15:16:24 ON 30 AUG 2005  
27910 S L1

L3 FILE 'REGISTRY' ENTERED AT 15:16:33 ON 30 AUG 2005  
17997 S PC/PCT

L4 187300 S PES/PCT

L5 1 S 7664-38-2/RN H<sub>3</sub>PO<sub>4</sub>

L6 1 S GLYCIDYL ACRYLATE/CN

L7 5506 S 100-42-5/CRN AND (106-90-1/CRN OR 106-91-2/CRN)

ST + (GA & GMA)

L8 9 S L7 AND 2/NC

FILE 'CA' ENTERED AT 15:18:27 ON 30 AUG 2005

L9 36 S L1 AND L2 AND L8

L10 148 S L1 AND L2 AND L5

L11 2 S L10 AND QUENCH?

L12 146 S L10 NOT L11

=>

L12 ANSWER 78 OF 146 CA COPYRIGHT 2005 ACS on STN

AN 128:168148 CA

ED Entered STN: 31 Mar 1998

TI Thermoplastic polyester polycarbonate resin composition

IN Harashina, Hatsuhiro; Yamada, Tatsuya

PA Polyplastics Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L067-02

ICS C08K003-32; C08K003-38; C08K003-40; C08K005-02; C08K005-524;  
C08K005-55; C08K007-14; C08L069-00

CC 37-6 (Plastics Manufacture and Processing)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10036647	A2	19980210	JP 1996-193448	19960723
	JP 3432083	B2	20030728		
	JP 2003268212	A2	20030925	JP 2003-69462	19960723
PRAI	JP 1996-193448	A3	19960723		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 10036647	ICM	C08L067-02
		ICS	C08K003-32; C08K003-38; C08K003-40; C08K005-02; C08K005-524; C08K005-55; C08K007-14; C08L069-00

OS MARPAT 128:168148

AB Composition contains 1-99 parts polyesters, 1-99 parts polycarbonate, 0.001-10 parts boron compds., 0.001-10 parts phosphorus compds. The compds. have good molten thermal stability. A composition contained polybutylene terephthalate, Panlite L1225, B2O3, and phosphoric acid.

ST polyester polycarbonate resin compn; boron compd thermoplastic resin compn; phosphorus compd thermoplastic resin compn

IT Boroxanes

RL: MOA (Modifier or additive use); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

IT Polycarbonates, uses

RL: POF (Polymer in formulation); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

IT Polyesters, uses

RL: POF (Polymer in formulation); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

IT Polymer blends

RL: POF (Polymer in formulation); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

IT 98-80-6, Phenylboric acid 102-24-9 688-74-4, Tributyl borate

1303-86-2, Boron oxide, uses 2466-09-3, Pyrophosphoric acid

7664-38-2, Phosphoric acid, uses 10043-35-3, Ortho boric acid,

uses 12447-38-0, Tetraboric acid 13460-50-9, Metaboric acid

13598-36-2, Phosphorous acid, uses 36432-46-9, Tridecyl phosphonate

50813-16-6, Sodium metaphosphate 113962-53-1, Phosphorous acid,

monosodium salt

RL: MOA (Modifier or additive use); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

IT 24936-68-3, Panlite L1225, uses 24968-12-5, Polybutylene

terephthalate 25037-45-0, Bisphenol A-carbonic acid copolymer

26062-94-2, Polybutylene terephthalate

RL: POF (Polymer in formulation); USES (Uses)  
(thermoplastic polyester polycarbonate resin composition)

**Disclaimer:**

This English translation is produced by machine translation and may contain errors. The JPO, the NCIPI, and those who drafted this document in the original language are not responsible for the result of the translation.

**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 05:06:48 JST 08/31/2005

Dictionary: Last updated 10/12/2004 / Priority: 1. Chemistry

**CLAIMS****[Claim(s)]**

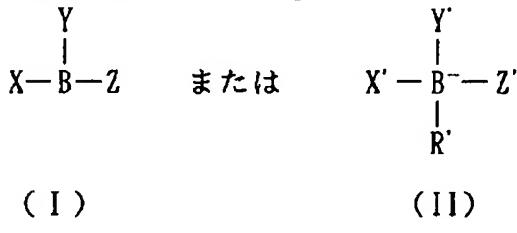
[Claim 1] (A) Polyester resin 1 - 99 weight sections, and (B) The sum total with polycarbonate resin 1 - 99 weight sections It is (C) to the 100 weight sections. Boron compound 0.001 - 10 weight section (D) Phosphorus compounds Thermoplastics constituent which blends 0.001 - 10 weight section.

[Claim 2] (A) The thermoplastics constituent according to claim 1 whose polyester resin is half-aromatic polyester.

[Claim 3] (A) The thermoplastics constituent according to claim 1 or 2 whose polyester resin is polybutylene terephthalate.

[Claim 4] (A) The thermoplastics constituent according to claim 1 or 2 whose polyester resin is isophthalic acid denaturation polybutylene terephthalate.

[Claim 5] (C) The thermoplastics constituent of Claim 1 - 4 which are at least one sort chosen from the boron compounds in which a boron compound is shown by a following general formula (I) or (II), those condensation products, or a salt given in any 1 term.

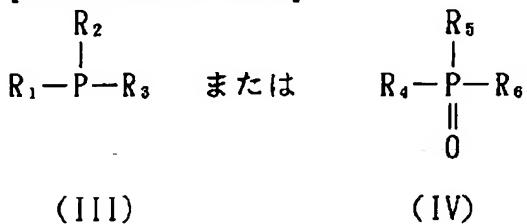
**[Chemical formula 1]**

however -- a formula -- ( -- I -- ) -- and -- ( -- II -- ) -- inside -- X -- Y -- Z -- and -- R -- ' -- X -- ' -- Y -- ' -- Z -- ' - OR -- or -- univalent -- an organic group -- it is . It is R here. H Or it is a univalent organic group. X, Y, and Z or -- R -- ' -- X -- ' -- Y -- ' -- Z -- ' -- inside -- each -- the same -- even if -- different from each other -- \*\*\*\* -- moreover -- these -- two -- a \*\* -- more than -- connecting -- a ring -- forming -- \*\*\*\*.

[Claim 6] (C) The thermoplastics constituent of Claim 1 -5 which are at least one sort as which the boron compound was chosen from orthoboric acid, metaboric acid, tetraboric acid, boron oxide, a borate, the ester of boric acid, a phenyl boric acid, or boroxine given in any 1 term.

[Claim 7] (D) The thermoplastics constituent of Claim 1 -6 which are at least one sort chosen from the phosphorus compounds in which phosphorus compounds are shown by a following general formula (III) or (IV), those condensation products, or a salt given in any 1 term.

[Chemical formula 2]



(However, R1, R2, R3, R4, R5, and R6 are H, -OR, or a univalent organic group among a formula (III) and (IV).) It is R here. H Or it is a univalent organic group. Moreover, even if each of R1, R2, R3 or R4, R5, and R6 is the same, moreover it may be different from each other, these two or more may connect and the ring may be formed.

[Claim 8] (D) The thermoplastics constituent of Claim 1 -7 whose phosphorus compounds are at least one sort chosen from a phosphoric acid, phosphorous acid, or those condensation products given in any 1 term.

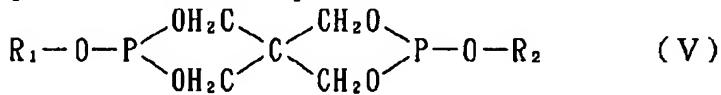
[Claim 9] (D) The thermoplastics constituent of Claim 1 -7 whose phosphorus compounds are at least one sort chosen from the salts of a phosphoric acid, phosphorous acid, or those condensation products given in any 1 term.

[Claim 10] (D) The thermoplastics constituent of Claim 1 -7 whose phosphorus compounds are at least one sort chosen from the ester derivatives of a phosphoric acid or phosphorous acid given in any 1 term.

[Claim 11] (D) The thermoplastics constituent of Claim 1 -7 whose phosphorus compounds are a phosphonic acid derivative or a phosphinic acid derivative given in any 1 term.

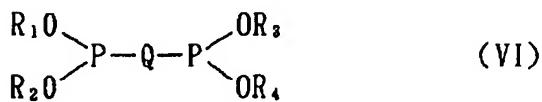
[Claim 12] (D) The thermoplastics constituent of Claim 1 -6 whose phosphorus compounds are the phosphorus compounds expressed with a following general formula (V) or (VI) given in any 1 term.

[Chemical formula 3]



(However, among [ R1 ] the formula, R2 are H or a univalent organic group, and even if each is the same, they may be different from each other.)

[Chemical formula 4]



(However, among [ R1 ] the formula, R2, R3, and R4 are groups chosen from H or a univalent organic group, and even if each is the same, they may be different from each other.) Moreover, Q It is a divalent organic group.

[Claim 13] Furthermore, the thermoplastics constituent of Claim 1 -12 which blended the inorganic bulking agent given in any 1 term.

[Claim 14] Furthermore, the thermoplastics constituent of Claim 1 -13 which blended the flame retarder given in any 1 term.

## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the thermoplastics constituent excellent in heat-of-fusion stability.

[0002]

[Description of the Prior Art] The polymer alloy which used polyester resin and polycarbonate resin as the component has the outstanding mechanical property, an electrical property, and other physical variances and chemical property, and is broadly used in the various industrial fields as engineering plastics. However, the thermal stability lowering guessed that this polymer alloy is based on an ester exchange reaction at the time of processing of extrusion, shaping, etc. advances, it is known as that result that material properties, such as a working characteristic, physical properties, and a chemistry property, will get worse remarkably, and the improvement of heat-of-fusion stability is demanded strongly. The improvement of lowering of this heat-of-fusion stability is strongly demanded not to mention unreinforcement system material with the fire retarding material which blended the composite material which blended inorganic system bulking agents, such as glass, or a flame retarder. In order to meet the demand of this heat-of-fusion stability improvement Polyester resin and polycarbonate resin are conventionally used as a component. To the becoming polymer alloy, [ phosphite ] the method (J. -- Devaux et al. --) of adding J. although the method (JP,H7-292213,A) of adding Polymer Science Polymer Physics Edition.Vol.20, 1875 (1982), or a boric acid is proposed These methods were not yet enough as the improvement effect, although or has been improved a little as for heat-of-fusion stability.

[0003]

[Means for solving problem] this invention person reached this invention, as a result of repeating examination wholeheartedly, in order to obtain the thermoplastics constituent which

consists of thermal stability, polyester resin excellent in especially heat-of-fusion stability, and polycarbonate resin. That is, this invention is (A). Polyester resin 1 - 99 weight sections, and (B) The sum total with polycarbonate resin 1 - 99 weight sections It is (C) to the 100 weight sections. Boron compound 0.001 - 10 weight section (D) Phosphorus compounds Blend 0.001 - 10 weight section. It is involved in the resin composition object which has the outstanding heat-of-fusion stability. There is especially the feature of this invention in the remarkable synergistic effect which is not acquired being discovered at heat-of-fusion stability by each independent combination by using a boron compound and phosphorus compounds together. [0004]

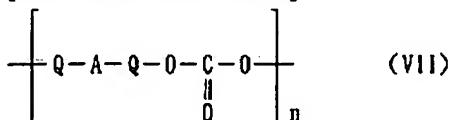
[Mode for carrying out the invention] This invention is hereafter explained to details. (A) used for this invention [ polyester resin ] It is polyester obtained by the polycondensation of a dicarboxylic acid compound and a dihydroxy compound, the polycondensation of a hydroxy acid compound, or the polycondensation of these 3 component mixture, and there is an effect of this invention also to any of gay polyester and copoly ester. If the example of the dicarboxylic acid compound used here is shown, a terephthalic acid, Isophthalic acid, naphthalene dicarboxylic acid, diphenyl dicarboxylic acid, The well-known dicarboxylic acid compounds like diphenyl ether dicarboxylic acid, bibenzyl dicarboxylic acid, cyclohexane dicarboxylic acid, an adipic acid, and a sebacic acid and such alkyls, and alkoxy \*\*\*\* are halogenation objects etc. Moreover, these dicarboxylic acid compounds can also be used in the form of lower alcohol ester like the derivative in which ester formation is possible, for example, dimethyl ester. In this invention, one sort of the compound like the above or two sorts or more are used. If the example of a dihydroxy compound is shown, next, ethylene glycol, propylene glycol, Butanediol, a diethylene glycol, triethylene glycol, A polyethylene glycol, a polypropylene glycol, a polytetramethylene glycol, Neopentyl glycol, hydroquinone, resorcinol, dihydroxy diphenyl ether, Cyclohexane diol, cyclohexane dimethanol, 2, and 2-screw (4-hydroxyphenyl) propane, The dihydroxy compounds like diethoxy-ized bisphenol A and such alkyls, and alkoxy \*\*\*\* are halogenation objects etc., and can carry out the mixed activity of one sort or the two sorts or more. Moreover, as for hydroxy acid, such as an oxy-benzoic acid, an oxy-naphthoic acid, and diphenylene hydroxy acid, and such alkyls, and alkoxy \*\*\*\*, a halogenation object etc. will be mentioned if the example of hydroxy acid is shown. Moreover, the derivative in which ester formation of these compounds is possible can also be used. In this invention, one sort of these compounds or two sorts or more are used. Although each thermoplastic polyester generated according to a polycondensation can be used by using the compound like the above as a monomer component, and it is independent, or two or more sorts use it in this invention, mixing, half-aromatic polyester is used preferably. For example, polyethylene terephthalate, polybutylene terephthalate, Polyethylenenaphthalate, polybutylene naphthalate, polycyclohexylene dimethylene terephthalate, the polyarylate that consists of

bisphenol A and benzene dicarboxylic acid, or isophthalic acid denaturation polybutylene terephthalate is mentioned. The improvement effect of the heat-of-fusion stability of this invention is remarkable in polybutylene terephthalate or isophthalic acid denaturation polybutylene terephthalate in particular.

[0005] (B) used for this invention Polycarbonate resin is the gay or copolymer manufactured using the dihydric phenols, the phosgene, or carbonic acid diester which has the repetition unit of a general formula (VII).

[0006]

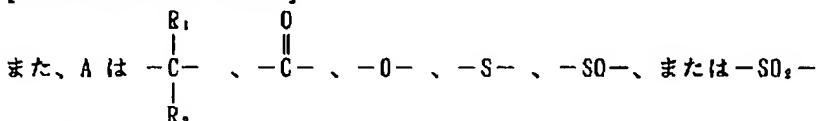
[Chemical formula 5]



[0007] (Q is chosen from an aromatic series group like naphthylene, phenylene, halogenation phenylene, or alkylene group displacement phenylene among a formula (VII) here.)

[0008]

[Chemical formula 6]



から選ばれる。

[0009] Here, R1 and R2 are chosen from H, a hydrocarbon group, or the group that forms the cycloalkane group with the contiguity carbon atom.

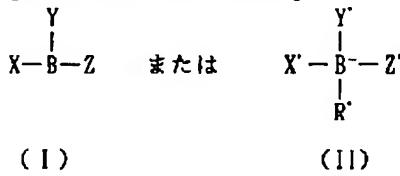
It is the polycarbonate system polymer specifically manufactured by making a bisphenol compound, and one or more sorts of phosgenes or carbonic acid diester react. As a bisphenol compound, screw (4-hydroxyphenyl) methane, 1 and 1-screw (4-hydroxyphenyl) ethane, 1, and 1-screw (4-hydroxyphenyl) propane, 2 and 2-screw (4-hydroxyphenyl) propane, 2, and 2-screw (4-hydroxyphenyl) butane, 2 and 2-screw (4-hydroxyphenyl) octane, 2, and 2-screw (4-hydroxyphenyl) pentane, 2 and 2-screw (4-hydroxyphenyl) 3-methyl butane, 2, and 2-screw (4-hydroxyphenyl) hexane, 1 and 1-screw (4-hydroxyphenyl) cyclopentane, 1, and 1-screw (4-hydroxyphenyl) cyclohexane, Screw (4-hydroxy 3-methylphenyl) methane, 1, and 1-screw (4-hydroxy 3-methylphenyl) ethane, 2 and 2-screw (4-hydroxy 3-methylphenyl) propane, 2 and 2-screw (4-hydroxy 3, 5-dimethylphenyl) propane, 2, and 2-screw (4-hydroxy 3-ethyl phenyl) propane, 2, and 2-screw (4-hydroxy 3-t-butylphenyl) propane, 2 and 2-screw (4-hydroxy 3-BUROMO phenyl) propane, Screw (4-hydroxyphenyl) phenyl methane, screw (4-hydroxyphenyl) diphenylmethane, A screw (4-hydroxyphenyl) dibenzyl methane, 1, and 1-screw (4-hydroxyphenyl)-1-phenyl propane, Screw (hydroxy aryl) alkanes, such as 2, 2, 2', 2'-

tetrahydro 3, 3, 3', 3'-tetramethyl 1, and 1 '- Spirobi [1H-indene]-6, 6'-diol, Dihydroxy aryl ketones, such as - dihydroxy 3 and 4 and 4'-dihydroxy diphenyl ketone, 4, and 4'3'-dimethyl diphenyl ketone, Dihydroxy aryl ether, such as - dihydroxy 3 and 4 and 4'-dihydroxy diphenyl ether, 4, and 4'3'-dimethyl diphenyl ether, Dihydroxy diaryl sulfides, such as - dihydroxy 3 and a 4 and 4'-dihydroxydiphenyl sulfide, 4, and 4'3'-dimethyl diphenyl sulfide, Dihydroxy diaryl sulfones, such as - dihydroxy 3 and 4 and 4'-dihydroxy diphenylsulfone, 4, and 4'3'-dimethyl diphenylsulfone, Dihydroxy diaryl sulfoxides, such as - dihydroxy 3 and a 4 and 4'-dihydroxydiphenyl sulfoxide, 4, and 4'3'-dimethyl diphenyl sulfoxide, are mentioned. In these, 2 and 2-screw (4-hydroxyphenyl) propane, i.e., bisphenol A, is especially desirable. As carbonic acid diester, moreover, diphenyl carbonate, ditolyl carbonate, Screw (chlorophenyl) carbonate, m-cresyl carbonate, dinaphthyl carbonate, screw (diphenyl) carbonate, diethyl carbonate, dimethyl carbonate, dibutyl carbonate, dicyclohexyl carbonate, etc. are mentioned. In these, diphenyl carbonate is especially desirable. In this invention, it is (A). A component and (B) The ranges of the ratio [(A) /(B)] of a component are 1 / 99 - 99/1. If a ratio separates from this range, the effect as an alloy will not be discovered.

[0010] (C) used for the thermoplastics constituent of this invention as one of the essential ingredients The inorganic matter and the organic boron compound which were chosen from the boron compounds in which a boron compound is shown by a following general formula (I) or (II), those condensation products, or a salt are contained.

[0011]

[Chemical formula 7]



[0012] however -- a formula -- ( -- I -- ) -- and -- ( -- II -- ) -- inside -- X -- Y -- Z -- and -- R -- ' -- X -- ' -- Y -- ' -- Z -- ' - OR -- or -- univalent -- an organic group -- it is . It is R here. H Or it is a univalent organic group. X, Y, and Z or -- R -- ' -- X -- ' -- Y -- ' -- Z -- ' -- inside -- each -- the same -- even if -- different from each other -- \*\*\*\* -- moreover -- these -- two -- a \*\* -- more than -- connecting -- a ring -- you may form .

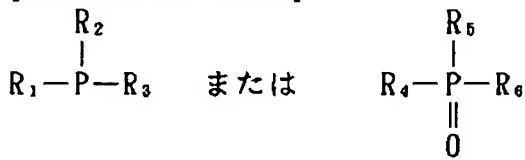
As an inorganic boron compound, boric-acid compounds, such as orthoboric acid, metaboric acid, and tetraboric acid, Boron oxide, such as 2 oxidation 2 boron, 3 oxidation 2 boron, 3 oxidation 4 boron, and 5 oxidation 4 boron, The ammonium salt of a boric acid, the alkaline metal salt (a metaboric acid potassium, sodium tetraborate, etc.) of a boric acid, or alkaline earth metal salt (boric-acid calcium, zinc borate, orthoboric acid magnesium, orthoboric acid barium, etc.) are mentioned. Also in these, orthoboric acid, metaboric acid, tetraboric acid, and boron oxide have a high effect, and it is used preferably, and, as for these boric-acid

compounds, a commercial item can be used. As an organic boron compound, boroxine, a phenyl boric acid, a diphenyl boric acid or a boric acid, an alcohol compound, or an ester-of-boric-acid compound with a phenolic compound is mentioned. for example, C1 - the aliphatic series monoalcohol of C20, and polyhydric alcohol (ethylene glycol --) A tetra-butylene glycol, a glycerol, pentaerythritol, etc., boric-acid mono-\*\* JI, TORI or tetra-ester compounds with phenolic compounds (a phenol, a catechol, resorcinol, hydroquinone, cresol, etc.), and those mixture -- those metal salts are mentioned further. Also in these, boroxine or a phenyl boric acid has a high effect, and is used preferably. Moreover, although there is no limit in particular, in the case of boron oxide and a borate, the one where a grain system is smaller is excellent in an effect, and the particle size of the boron compound used is 10 micrometers. The following are used preferably. in this invention -- (C) like the above the loadings of a boron compound -- (A) The sum total of a component and the (B) component As opposed to the 100 weight sections 0.001 - 10 weight section -- especially -- desirable -- It is 0.005 - 5 weight section. Thus, the improvement effect of remarkable heat-of-fusion stability is [ with a little combination ] discovered with concomitant use with phosphorus compounds. An addition Under in the 0.001 weight section, if the thermal stability improvement effect which this invention plans is scarce and 10 weight sections are exceeded, a superfluous boron compound will reduce material physical properties.

[0013] (D) used for the thermoplastics constituent of this invention as another essential ingredient The inorganic matter and the organic phosphorous compound which were chosen from the phosphorus compounds in which phosphorus compounds are shown by a following general formula (III) or (IV), those condensation products, or a salt are contained.

[0014]

[Chemical formula 8]



(III)

(IV)

[0015] (However, R1, R2, R3, R4, R5, and R6 are H, -OR, or a univalent organic group among a formula (III) and (IV).) It is R here. H Or it is a univalent organic group. Moreover, even if each of R1, R2, R3 or R4, R5, and R6 is the same, moreover it may be different from each other, these two or more may connect and a ring may be formed.

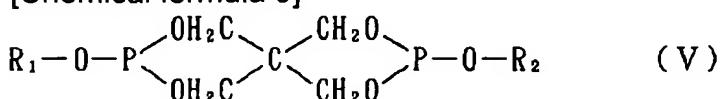
As inorganic phosphorus compounds, condensation products and those salts are contained not to mention alt.\*\* like a phosphoric acid or phosphorous acid like a pyrophosphoric acid, diphosphorus acid, a metaphosphoric acid, a TORIME thalline acid, or polyphosphoric acid. As a salt, metal salts, such as ammonium salt or lithium salt, sodium salt, potassium salt,

magnesium salt, calcium salt, barium salt, manganese salt, iron salt, nickel salt, zinc salt, silver salt, an aluminum salt, and tin salt, are mentioned. For example, ammonium dihydrogenphosphate, diammonium hydrogenphosphate, ammonium phosphate, Phosphorous acid 2 hydrogen ammonium, phosphorous acid hydrogen ammonium, ammonium sodium hydrogenphosphate, A sodium dihydrogenphosphate, disodium hydrogenphosphate, sodium phosphate, Sodium hydrogenphosphite, a sodium phosphite, sodium hypophosphite, potassium phosphate, magnesium phosphate, phosphoric-acid zinc, pyrophosphoric-acid 2 hydrogen disodium, pyrophosphoric-acid 4 sodium, pyrophosphoric-acid calcium, sodium metaphosphate, sodium polyphosphate, etc. are mentioned. As an organic phosphorous compound, an organic phosphoric acid or phosphite is mentioned like the displacement ammonium salt and displacement phosphonium salt of a phosphoric acid or phosphorous acid. For example, phosphoric-acid 2 hydrogen tetrabutyl ANNIMOUMU, phosphorous acid 2 hydrogen tetrabutylammonium, Phosphoric-acid 2 hydrogen tetra-phenyl ammonium, phosphorous acid 2 hydrogen tetra-phenyl ammonium, Phosphoric-acid 2 hydrogen tetrabutyl phosphonium, phosphorous acid 2 hydrogen tetrabutyl phosphonium, phosphoric-acid 2 hydrogen tetra-phenyl phosphonium, phosphorous acid 2 hydrogen tetra-phenyl phosphonium, etc. are mentioned. Furthermore, the alcohol compound of a phosphoric acid or phosphorous acid or an ester compound with a phenolic compound is mentioned as an organic phosphorous compound. For example, trimethyl phosphate, phosphoric-acid methyl diethyl, phosphoric-acid diethyl, Phosphoric-acid triethyl, phosphoric-acid dibutyl, tributyl phosphate, phosphoric-acid tridecyl, Phosphoric ester compounds, such as triphenyl phosphate and phosphoric-acid tribenzyl, Phosphorous acid dimethyl, phosphorous acid TORIMECHIRU, phosphorous acid diethyl, phosphorous acid triethyl, Phosphorous acid dibutyl, phosphorous acid tributyl, phosphorous acid JIISO octyl, Phosphorous acid tridecyl, phosphorous acid TORIRAUIRU, phosphorous acid phenyl diisodecyl, Phosphite compounds, such as phosphorous acid diphenyl iso octyl, phosphorous acid diphenyl isodecyl, phosphorous acid diphenyl, phosphorous acid triphenyl, phosphorous acid tribenzyl, phosphorous acid tricyclohexyl, and phosphorous acid phenyl neopentyl glycol, are mentioned. Moreover, a phosphonic acid derivative or a phosphinic acid derivative is also contained as a desirable organic phosphorous compound. For example, methylphosphonic acid, ethyl phosphonic acid, butyl phosphonic acid, Phenylphosphonic acid, methylphosphonic acid dimethyl, methylphosphonic acid diphenyl, Phosphonic acid compounds, such as phenylphosphonic acid dimethyl, phenylphosphonic acid diphenyl, 3, and 5-G t-butyl 4-hydroxy benzylphosphonate diethyl ester, Phosphinic acid compounds, such as dimethyl phosphinic acid, ethyl phosphinic acid, butyl phosphinic acid, a diphenylphosphine acid, and dimethyl phosphinic acid methyl, are mentioned. Especially in these, 3 and 5-G t-butyl 4-hydroxy benzylphosphonate diethyl ester can obtain as a commercial industrial article, and a remarkable stabilization effect is

discovered with concomitant use with a boron compound. Furthermore, (D) As phosphorus compounds, the phosphorus compounds expressed with a following general formula (V) or (VI) are also contained.

[0016]

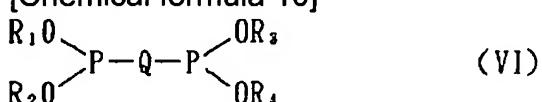
[Chemical formula 9]



[0017] (However, among [ R1 ] the formula, R2 are H or a univalent organic group, and even if each is the same, they may be different from each other.)

[0018]

[Chemical formula 10]

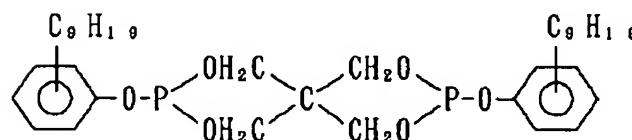
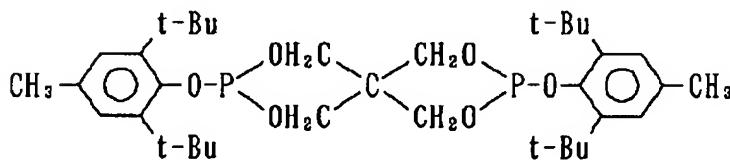
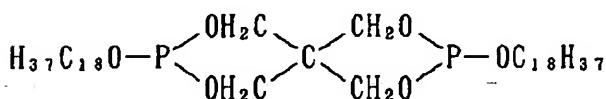
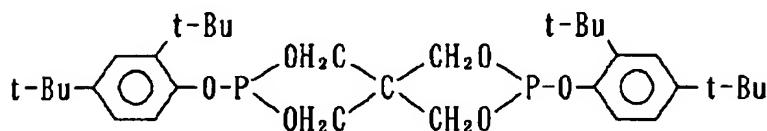
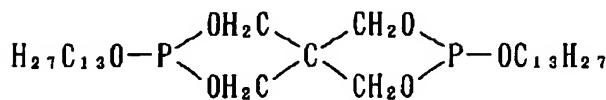


[0019] (However, among [ R1 ] the formula, R2, R3, and R4 are groups chosen from H or a univalent organic group, and even if each is the same, they may be different from each other.) Moreover, Q It is a divalent organic group.

(V) The compound shown below is mentioned as a compound contained in a formula.

[0020]

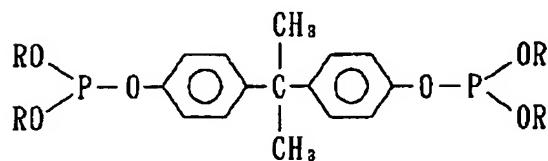
[Chemical formula 11]



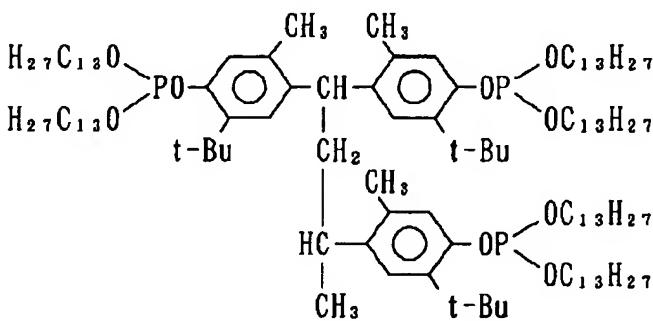
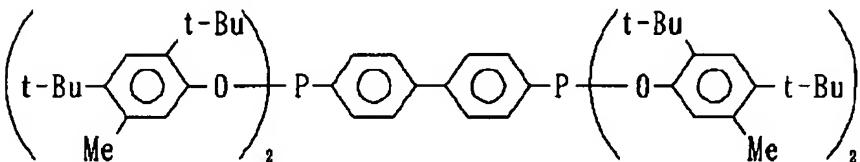
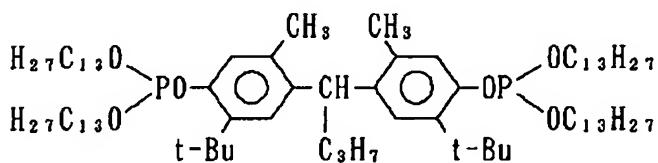
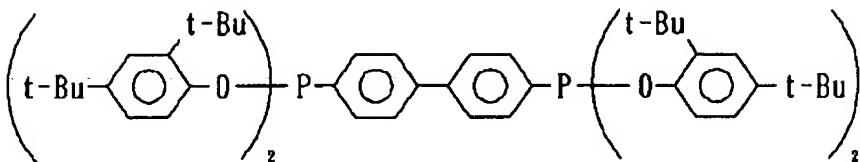
[0021] Moreover, the compound shown below is mentioned as a compound contained in the (VI) type.

[0022]

[Chemical formula 12]



R = C<sub>12</sub>~C<sub>16</sub> アルキル



[0023] These compounds can be obtained as a commercial industrial article, and a remarkable stabilization effect discovers them according to concomitant use with a boron compound. in this invention -- (D) like the above the loadings of specific phosphorus compounds -- (A) A component and (B) The sum total with a component As opposed to the 100 weight sections 0.001 - 10 weight section -- especially -- desirable -- It is 0.005 - 5 weight section. Thus, the improvement effect of remarkable heat-of-fusion stability is [ with a little combination ] discovered with concomitant use with a boron compound. An addition is 0.001. Under in the

weight section, if the improvement effect of the heat-of-fusion stability which this invention plans is scarce and 10 weight sections are exceeded, superfluous phosphorus compounds will reduce material physical properties.

[0024] [ the effect of this invention ] not to mention effective in an improvement of the heat-of-fusion stability of the thermoplastics constituent which does not contain an inorganic filler The constituent which added the inorganic bulking agent added by common thermoplastics or thermosetting resin, and carried out the reinforcement improvement or a flame retarder, and a fire-resistant assistant are blended, and a prominent effect is shown also to the constituent which gave fire retardancy. As an inorganic bulking agent blended with the constituent of this invention according to the purpose of use, various kinds of fibrous, the shape of a powder, and a tabular bulking agent are mentioned. As a fibrous filler, for example, a glass fiber, an asbestos fiber, a silica fiber, Inorganic fiber-like matter, such as metal fibers, such as stainless steel, aluminum, titanium, copper, and brass, is mentioned to a silica alumina fiber, an alumina fiber, a zirconia fiber, boron nitride fiber, silicon nitride fiber, carbon fiber, a boron fiber, a potassium titanate fiber, and a pan. On the other hand as a powder-like bulking agent, carbon black, a graphite, a silica, quartz powder, A glass bead, a milled fiber, a glass balloon, glass powder, a calcium silicate, Aluminum silicate, a kaolin, talc, clay, diatomaceous earth, the silicate like wollastonite, The carbonate of the metal like the oxide of the metal like an iron oxide, titanium oxide, a zinc oxide, an antimony trioxide, and an alumina, a calcium carbonate, and a magnesium carbonate, a calcium sulfate, the sulfate like a barium sulfate, other ferrites, silicon carbide, silicon nitride, boron nitride, various metal powder, etc. are mentioned. Moreover, as a tabular bulking agent, a mica, a glass flake, various kinds of metallic foils, etc. are mentioned. these inorganic bulking agents -- one sort -- or two or more sorts can be used together. Moreover, the inorganic bulking agent used for this invention can also use a well-known finishing agent together by the physical properties for which it asks. If an example is shown, they will be functionality compounds, such as epoxy compound, an isocyanate system compound, a titanate compound, and a silane system compound. These bulking agents may perform and use surface treatment beforehand, or may add it simultaneously in the case of preparation of material. Here, as for the loadings of an inorganic bulking agent, 1 to 80 % of the weight is desirable to the constituent whole quantity.

[0025] As a flame retarder blended with the constituent of this invention according to the object of fire-resistant grant, nitrogen containing compounds, such as phosphorus compounds, an organic halogenated compound, and a melamine derivative, etc. are used. Also in these, especially a bromine compound is used preferably. For example, deca BUROMO diphenyloxide, a bromination cyanuric-acid-ester compound, The polycarbonate guided from an ethylene bis-tetrabromo phthalimide, bisphenol A, etc., or the bromination object of the monomers of an epoxy compound, or those polymers, they are the bromination object of

polystyrene oligomer, PENTABUROMO poly benzyl acrylate, bromination polyphenylene oxide, etc. -- these one sort -- or a two or more sort mixing activity is carried out. Moreover, as a fire-resistant assistant, metal oxides, hydroxides, etc., such as an antimony trioxide, antimony pentoxide, sodium antimonate, halogenation antimony, an aluminum hydroxide, and a magnesium hydroxide, are used.

[0026] Furthermore, what mixed other thermoplastics according to the purpose of use can be used for the constituent of this invention as base resin, and the effect of this invention is demonstrated. If the example of other thermoplastics mixed by the thermoplastics constituent here is shown Polyolefine, a polyamide, polyacetal, polystyrene, a styrene butadiene copolymer, Acrylonitrile Butadiene Styrene, a styrene butadiene acrylic-acid (or the ester) copolymer, An acrylonitrile styrene copolymer, polyurethane, a fluororesin, Polyphenylene oxide, a polyphenylene sulfide, polysulfone, Polyether sulphone, the poly ketone, polyether ketone, polyimide, Polyether imide, the poly benzimidazole, polybutadiene, isobutylene isoprene rubber, Silicone resin, thermoplastic elastomer olefin, a styrene thermoplastic elastomer, They are these denaturation objects of the core shell mold which is mainly concerned with thermoplastic elastomer urethane, thermoplastic elastomer polyester, thermoplastic elastomer polyamide, polyether system thermoplastic elastomer, and polyacrylate, such as a multilayer graft copolymer. Although these matter is not essential ingredients, it can use together according to the property made into the object, and the class and an addition can be chosen suitably.

[0027] Moreover, to the constituent of this invention, one or more sorts of usual additives, such as a coloring agent containing an antioxidant, an ultraviolet ray absorbent, lubricant, a release agent, a color, and a pigment, an antistatic agent, a surfactant, and a heat-resistant organicity bulking agent, can also be added.

[0028] Preparation of this invention is easily prepared by the well-known method generally used as the conventional resin composition object method of preparation. For example, the method of scouring with an extruder, carrying out lump extrusion, and preparing a pellet, after mixing each component, The pellet from which a presentation once differs is prepared, specified quantity mixing of the pellet is carried out, shaping is presented, and the method of obtaining the mold goods of the object presentation after shaping, the method of teaching 1 of each component or 2 or more directly to a making machine, etc. can use all. Moreover, the thing [ all adding a part at the time of the arbitration in manufacture / processing process of polyester resin and/or polycarbonate resin ] is also possible for the boron compound and phosphorus compounds which are the essential ingredients of this invention.

[0029]

[Working example] Next, although this invention is explained still more concretely with an example and a comparative example, this invention is not limited to these.

The sum total of the <sample preparation (1)> example 1-20 and a comparative example 1 - the 23 polyester-resin (A1 or A2) 80 weight section, and the polycarbonate resin (B1) 20 weight section [ the 100 weight sections ] With the 30mmphi twin screw extruder after carrying out specified weight section mixing of the various boron compounds and phosphorus compounds which are shown in a table 1 Melting kneading was carried out at 260 degrees C, and the pellet was prepared. Subsequently, the following heat-of-fusion stability measurement was performed using this pellet. A result is shown in a table 1. Moreover, only phosphorus compounds blended only the boron compound, the comparison sample was prepared by the same operation, and heat-of-fusion stability was evaluated. The result of a comparison sample is shown in a table 2.

[ with <heat-of-fusion stability measurement> A. differential scanning calorimetric analysis equipment (DSC: made by PerkinElmer, Inc. DSC-7) ] Using sample 10mg started from the pellet, heat cycle measurement was performed in the following condition under nitrogen flow atmosphere, and the melting point (Tm) in the 2nd temperature-up scan was made into the index of heat-of-fusion stability.

[DSC heat cycle measurement conditions]

30 degree-C-> temperature-up (20 degrees C/min) -> 260 degree-C(20-minute maintenance) -> temperature fall (20 degrees C/min) -> 100 degree C (1-minute maintenance) -> temperature up (20 degrees C/min) -> [ with 260 degree-CB. thermogravimetric analysis equipment (TGA: made by PerkinElmer, Inc. TGA-7) ] Using sample 10mg started from the pellet, melting heating was carried out by 260 \*\* under air flow atmosphere, the rate of weight loss for 20 minutes for [ melting time amount / 5 minutes - ] 25 minutes (deltaT) was measured, and it was considered as the index of heat-of-fusion stability.

[0030] (2) The sum total of an example 21-30 and a comparative example 24 - the 33 polyester-resin (A1 or A2) 80 weight section, and the polycarbonate resin (B1) 20 weight section [ the 100 weight sections ] With the 30mmphi twin screw extruder after carrying out specified weight section mixing of the various boron compounds and phosphorus compounds which are shown in a table 3 At 260 degrees C, carrying out side feed of the inorganic bulking agent of the specified weight section, melting kneading was carried out and the pellet was prepared. Subsequently, the same technique as the above estimated heat-of-fusion stability of the pellet. A result is shown in a table 3. Moreover, only phosphorus compounds blended only the boron compound, the comparison sample was prepared by the same operation, and heat-of-fusion stability was evaluated. The result of a comparison sample is shown in a table 4.

[0031] (3) an example 31-40 and a comparative example 34-44 -- again in order to see the effect in a fire-resistant system The sum total of the polyester resin (A1 or A2) 90 weight section and the polycarbonate resin (B1) 10 weight section [ the 100 weight sections ] It is a 30mm[ the specified weight section and after carrying out specified weight section mixing of

various boric-acid compounds and the phosphorus compounds further] phi twin screw extruder about the various flame retarders and the fire-resistant assistant which are shown in a table 5. Melting kneading was carried out at 260 degrees C, and the pellet was prepared. Subsequently, the DSC heat cycle measurement by a following condition estimated heat-of-fusion stability of the pellet. Moreover, the rate of heat weight loss was measured with the same technique as the above, and heat-of-fusion stability of the pellet was evaluated. A result is shown in a table 5.

[DSC heat cycle measurement conditions]

30 degree-C-> temperature-up (20 degrees C/min) -> 260 degree-C(10-minute maintenance) -> temperature fall (20 degrees C/min) -> 100 degree C (1-minute maintenance) -> temperature up (20 degrees C/min) -> 260 degree C again Only phosphorus compounds blended only the boron compound, the comparison sample was prepared by the same operation, and heat-of-fusion stability was evaluated. The result of a comparison sample is shown in a table 6.

[0032]

[Table 1]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	融点 ℃	加熱重量減少率 %
実施例 1	C2 0.05	D1 0.01	221.1	0.071
実施例 2	C2 0.05	D2 0.01	221.1	0.075
実施例 3	C2 0.05	D3 0.01	221.1	0.080
実施例 4	C2 0.05	D4 0.01	222.0	0.069
実施例 5	C1 0.2	D5 0.05	221.9	0.071
実施例 6	C1 0.2	D6 0.1	220.0	0.081
実施例 7	C1 0.2	D7 0.2	221.2	0.094
実施例 8	C1 0.2	D8 0.2	221.0	0.083
実施例 9	C1 0.2	D9 0.2	221.1	0.068
実施例10	C2 0.1	D10 0.2	221.7	0.097
実施例11	C2 0.1	D6 0.1	222.0	0.079
実施例12	C2 0.1	D7 0.2	222.2	0.085
実施例13	C2 0.1	D9 0.2	222.2	0.070
実施例14	C3 0.2	D4 0.01	221.2	0.089
実施例15	C4 0.2	D3 0.01	220.9	0.102
実施例16	C5 0.2	D7 0.2	222.3	0.099
実施例17	C6 0.2	D9 0.2	221.5	0.086
実施例18	C1 0.2	D6 0.2	204.5	0.124
実施例19	C1 0.2	D7 0.2	204.3	0.121
実施例20	C2 0.05	D9 0.2	204.1	0.135

注) 実施例1~17は熱可塑性樹脂として、A1を使用した。

実施例18~20は熱可塑性樹脂として、A2を使用した。

[0033]

[Table 2]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	融 点 ℃	加熱重量減 少率 %
比較例1	—	—	203.0	0.248
比較例2	—	D1 0.01	215.3	0.135
比較例3	—	D2 0.01	216.3	0.143
比較例4	—	D3 0.01	215.6	0.142
比較例5	—	D4 0.01	216.4	0.133
比較例6	—	D5 0.05	211.3	0.149
比較例7	—	D6 0.1	216.2	0.151
比較例8	—	D7 0.2	202.5	0.168
比較例9	—	D8 0.2	203.3	0.162
比較例10	—	D9 0.2	216.6	0.144
比較例11	—	D10 0.2	202.5	0.188
比較例12	C1 0.2	—	206.4	0.145
比較例13	C2 0.1	—	206.8	0.140
比較例14	C3 0.2	—	203.9	0.201
比較例15	C4 0.2	—	203.5	0.196
比較例16	C5 0.2	—	203.7	0.182
比較例17	C6 0.2	—	204.1	0.147
比較例18	—	—	183.0	0.305
比較例19	C1 0.2	—	185.5	0.214
比較例20	C2 0.05	—	186.0	0.235
比較例21	—	D6 0.1	186.9	0.251
比較例22	—	D7 0.2	183.3	0.241
比較例23	—	D9 0.2	189.3	0.237

注) 比較例1~17は熱可塑性樹脂として、A1を使用した。

比較例18~23は熱可塑性樹脂として、A2を使用した。

[0034]

[Table 3]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	(B) 無機充填剤 重量部	融 点 ℃	加熱重量減 少率 %
実施例21	C2 0.05	D3 0.01	B1 40	224.1	0.051
実施例22	C2 0.05	D4 0.01	B1 40	224.2	0.049
実施例23	C1 0.2	D6 0.1	B1 40	223.9	0.059
実施例24	C1 0.2	D7 0.2	B1/E2 20/20	224.3	0.067
実施例25	C1 0.2	D9 0.1	B1/E3 20/20	224.2	0.052
実施例26	C2 0.1	D6 0.2	B4 40	224.4	0.058
実施例27	C2 0.1	D10 0.2	B4 40	223.8	0.068
実施例28	C1 0.2	D6 0.1	B1 40	205.1	0.088
実施例29	C1 0.2	D7 0.2	B1 40	205.6	0.087
実施例30	C2 0.1	D9 0.2	B1 40	205.3	0.091

注) 実施例21~27は熱可塑性樹脂として、A1を使用した。

実施例28~30は熱可塑性樹脂として、A2を使用した。

[0035]

[Table 4]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	(E) 無機充填剤 重量部	融 点 ℃	加熱重量減 少率 %
比較例24	—	—	E1 40	186.1	0.188
比較例25	—	D6 0.1	E1 40	188.2	0.156
比較例26	—	D7 0.2	E1/E2 20/20	187.9	0.167
比較例27	—	D9 0.1	E1/E3 20/20	185.3	0.151
比較例28	C1 0.2	—	E1/E3 20/20	205.2	0.113
比較例29	C2 0.1	—	E4 40	203.4	0.106
比較例30	—	—	E4 40	175.8	0.223
比較例31	—	D7 0.1	E1 40	174.1	0.192
比較例32	C1 0.2	—	E1 40	180.6	0.151
比較例33	C2 0.1	—	E1 40	179.2	0.149

注) 比較例24~29は熱可塑性樹脂として、A1を使用した。

比較例30~33は熱可塑性樹脂として、A2を使用した。

[0036]

[Table 5]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	(F) 難燃剤 重量部	(G) 難燃助剤 重量部	融 点 ℃	加熱重量減 少率 %
実施例31	C2 0.05	D3 0.01	F1 14	G1 5	221.3	0.174
実施例32	C2 0.05	D4 0.01	F2 25	G1 7	219.5	0.163
実施例33	C1 0.2	D6 0.1	F3 22	G1 6	220.5	0.181
実施例34	C1 0.2	D7 0.2	F4 17	G1 6	220.7	0.220
実施例35	C1 0.2	D9 0.2	F4 17	G1 6	220.1	0.159
実施例36	C1 0.2	D10 0.2	F5 17	G1 8	219.1	0.172
実施例37	C2 0.1	D6 0.2	F5 17	G1 8	219.8	0.196
実施例38	C2 0.1	D9 0.2	F4 17	G1 8	219.2	0.165
実施例39	C6 0.2	D9 0.2	F4 17	G2 8	219.6	0.203
実施例40	C1 0.2	D9 0.2	F5 17	G1 8	203.7	0.225

注) 実施例31~39は熱可塑性樹脂として、A1を使用した。

実施例40は熱可塑性樹脂として、A2を使用した。

[0037]

[Table 6]

	(C) ホウ素化合物 重量部	(D) リン化合物 重量部	(F) 難燃剤 重量部	(G) 難燃助剤 重量部	融 点 ℃	加熱重量減 少率 %
比較例34	—	—	F1 14	G1 5	204.3	0.842
比較例35	—	—	F2 25	G1 7	203.7	0.583
比較例36	—	—	F3 22	G1 6	203.5	0.650
比較例37	—	—	F4 17	G1 6	202.7	0.731
比較例38	—	—	F4 17	G1 6	200.1	0.624
比較例39	C1 0.2	—	F5 17	G1 8	210.1	0.294
比較例40	C2 0.1	—	F4 17	G1 8	210.8	0.290
比較例41	C6 0.2	—	F4 17	G2 8	210.2	0.409
比較例42	—	—	F5 17	G1 8	189.6	1.13
比較例43	—	—	F5 17	G1 8	187.7	0.857
比較例44	C1 0.2	—	F5 17	G1 8	191.5	0.425

注) 比較例34～41は熱可塑性樹脂として、A1を使用した。

比較例42～44は熱可塑性樹脂として、A2を使用した。

### [0038] Notes

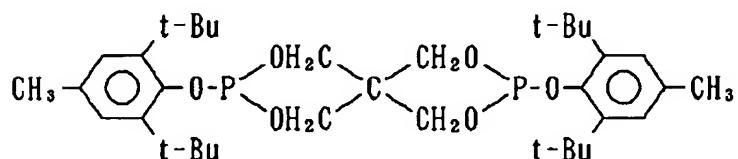
(A) polyester resin A1:polybutyrene-terephthalate-resin A2:12.5mol% -- isophthalic acid  
denaturation polybutyrene-terephthalate-resin (B) polycarbonate resin B1: -- polycarbonate  
resin (Teijin formation bread light L1225)

(C) the 2:boron compound C1:orthoboric acid C 3 oxidation 2 -- boron C3:sodium-tetraborate  
C4:boric-acid tributyl C5:trimethoxy boroxine (CH<sub>3</sub>O) [ 3B3O3C6:phenyl boric-acid (D)  
phosphorus-compounds D1:phosphoric-acid D2:metaphosphoric acid ] (67wt% of sodium  
metaphosphate is contained)

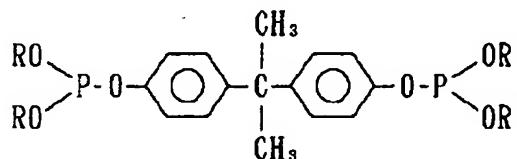
D3: Pyrophosphoric-acid D4:phosphorous acid D5:phosphorous acid 2 hydrogen sodium D6 :  
Phosphorous acid tridecyl [0039]

[Chemical formula 13]

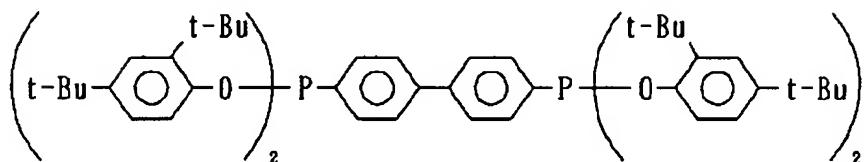
D7 : アデカアーガス社製 MARK P E P 3 6



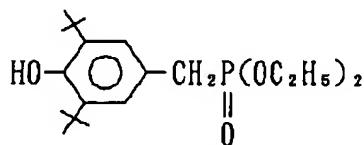
D8 : アデカアーガス社製 MARK 1 5 0 0

 $R = C_{12} \sim C_{16}$  アルキル

D9 : チバガイギー社製 イルガフォス P - E P Q F F



D10 : チバガイギー社製 イルガノックス 1 2 2 2



[0040] (E) Inorganic bulking agent E1: Glass fiber (epoxy system sizing agent)

E2: Glass flake (E glass)

E3: [ milled fiber E4:glass bead ] (F) Flame-retarder F1: polycarbonate F4:ethylene bis-tetrabromo phthalimide F5:PENTABUROMO poly benzyl acrylate [ F3:bromination ] (G) fire-retardancy assistant G1:antimony-trioxide G2:sodium antimonate [0041] deca BUROMO diphenyloxide F2: -- brominated epoxy resin --

[Effect of the Invention] It is (A) so that clearly [ in the above explanation and an example / the effect of this invention ]. Polyester resin and (B) To a polymer alloy with polycarbonate resin, it

is (C). A boron compound and (D) by using together and blending phosphorus compounds The thermoplastics constituent excellent in heat-of-fusion stability can be offered.

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[Translation done.]